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ABSTRACT

The subsidy available to undergraduate students is examined, with attention to the total amount of money available from all sources to students attending college (but excluding the individual and family contribution). The analysis identifies what resources are available directly to students and how many dollars are available as a subsidy through the institution. The cumulative effects of the subsidies are evaluated to determine the degree to which the funds are equitably distributed among students from different income groups, racial and ethnic background, and ability levels. No attempt is made to determine the source of the subsidy, only the amount. Information is included as to whether the students are enrolled in a two-year public college, a four-year public college, or a private college. Data sources are longitudinal data on the high school graduating class of 1980, the High School and Beyond study, and the Higher Education General Institutional Survey. The central concern is whether the average subsidies available to students are equitable. Study questions are: whether student aid subsidies are progressive relative to student income; whether institutional subsidies are neutral across income categories; and whether subsidies will be greater for students in private colleges than for those in public colleges. 11 references. (SW)

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The Equi
ty of Higher Education Subsidies

by

John B. Lee

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The Equity of Higher Education Subsidies

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Preface.

Special thanks needs to be given to a number of people who helped produce this report. Richard Chopper provided the programming support for the project and Gregory Shook was responsible for the production of the report. Both were patient and understanding of the many changes that were requested throughout the project.

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THE EQUITY OF HIGHER EDUCATION SUBSIDIES

I. INTRODUCTION

Economists and policy makers have argued for years about whether this country is over or under investing in higher education (Schultz, 1972). Most of the discussions are based on very general estimates of what we as a nation are expending on higher education. The total figures used are aggregate estimates and do not differentiate among purposes to which the money is put nor do they trace the patterns of expenditure available to different types of students attending college. This results in part from the complicated nature of how colleges, and the students attending, are supported. Money flows to institutions from different levels of government and from private sources with various degrees of restrictions on how the money can be expended. A good deal of the money is spent for activities that are not directly related to the educational mission of the institution. Examples include the operation of hospitals, research institutes, dormitories, bookstores and cafeterias. In addition, many students receive direct assistance in the form of grants, subsidized loans and work programs (Brinkman, 1985).

The specific information developed in this report concerns the subsidy available to undergraduate students. The report examines the total amount of money available from all sources to students attending college. The analysis identifies what resources are available directly to students and how many dollars are available as a subsidy through the institution. The cumulative effects of the subsidies will be evaluated to determine the degree to which the funds are equitably distributed among students from different income groups, racial and ethnic background and ability levels.

Because the sources of higher education income are so diverse, it is difficult to determine in an individual case who provides the subsidy. In this paper no attempt is made to determine the source of the subsidy, only the amount. It is not possible to determine whether private, federal, local, or state dollars are expended for education because, given financial reporting procedures, institutional income cannot be linked directly to specific expenditures and students do not reliably report sources of student aid.

The most important factor in determining the amount of subsidy appears to be the institutional choice of the student. The decision to go to college obviously determines whether a subsidy is provided. This analysis is limited to those in college. Those who do not attend receive no subsidy. If the student decides to attend, the choice of where to go to college influences, in large part, the amount of subsidy that will be available. The amount that a college spends on undergraduate education depends on a number of considerations including the control, mission, location, and size. Once the student decides to go to a specific college, that choice, along with the student's financial situation, determines the amount of aid for which that student is eligible. In part, student decisions are limited by

institutional admission requirements. Low ability students have fewer colleges from which to choose than do high ability students. The choice of institutions is also somewhat narrower for low income students than for high income students who can afford to pay the tuition and living cost at more expensive colleges. Student aid does not necessarily assure low income students equal choice of high cost colleges (Jackson, 1986).

For this analysis, an assumption is made that students do not distribute themselves randomly among colleges so subsidy patterns among different types of students will vary. The student characteristics included in this analysis are family income, race and ethnic group, and ability. Information is included as to whether they enrolled in a two-year public college, a four-year public college or a private college. This set of characteristics allows an examination of whether subsidies are equitably distributed, as well as helps in understanding some factors associated with the subsidy. There is no implicit assumption about how much subsidy is provided by different types of institutions. A private college with high tuition could spend more on student education and yet provide less subsidy than a public college with low tuition and a large state subsidy. The amount expended on education by the college includes the tuition paid by a student and is a different measure than the subsidy provided, which is the amount of money available for education from sources other than the student.

There are inter-relationships among the different student characteristics. For example, Blacks, Hispanics and Indians have lower incomes, as groups, than do Whites. Previous research indicates that ability is correlated to income, with high income associated with high ability. Also lower income students tend to enroll in lower tuition colleges (Lee, 1985). Very little is known about the patterns of subsidies available to students through the combination of institutional expenditure and student aid. This results, in part, from the lack of a common data set that allows both student finances and institutional finances to be investigated simultaneously. The longitudinal data on the high school graduating class of 1980, High School and Beyond (HS&B) and the Higher Education General Institutional Survey (HEGIS) are the sources for individual and institutional data used to develop estimates of subsidies available to students attending college. The information on student aid was taken from HS&B and institutional finance information was taken from HEGIS.

The central concern guiding this analysis is whether the average subsidies available to students are equitable. The first question to be investigated is whether student aid subsidies are progressive relative to student income. The second question will be to determine if institutional subsidies are neutral across income categories. It is expected that the combination of institutional and student subsidies will result in an overall subsidy that favors low income students. To the degree that minority groups have, on the average, lower income than majority students, minorities should receive more student aid, and the same level of institutional subsidy, as majority students. Because ability correlates with income, it is expected that low ability students will receive more student aid than high ability students. This is balanced by the probability that high ability students will be more likely to enroll in selective institutions which provide

greater institutional subsidies. The final question to be investigated is whether subsidies will be greater for students in private colleges than for those in public colleges because high tuition would result in higher levels of student aid for students with equal ability to pay. It is assumed that the total subsidy available to students in public and private colleges will be the same, even though private colleges may spend more on education, when tuition is included in addition to the subsidy.

This is a limited study designed to determine if the subsidy concept is a useful one that can be used to help evaluate the overall effect of the complex, decentralized system that has evolved to finance higher education and students in this country. The results are tentative and suggest new problems and analyses that are needed if more time and money is available for the future research on this topic.

A. What is the Issue?

Postsecondary education includes the universe of accredited programs that lead to any certificate or degree. Higher education is comprised of those institutions that provide at least a two-year degree. In the HEGIS universe there are approximately 3,300 higher education institutions, that enroll 12.5 million students. This excludes many proprietary, nursing, public vocational colleges and other specialized institutions, along with the students they serve.

The total cost of the higher education enterprise in this country is estimated to be $100 billion a year. According to the 1985 edition of The Condition of Education published by the Center for Education Statistics (CES), state governments provide 44 percent of all funding for public four-year institutions and 50 percent for public two-year institutions but only two percent for all private institutions. The federal government provides 13 percent of the operating budget of all colleges and universities, mostly through contracts and grants.

Students provide about one-third of the income of higher education institutions through tuition payments. The federal government and, to a lesser degree, states provide subsidies directly to students in the form of grants and subsidized loans which do not appear as institutional support. Just under half the enrolled college students receive at least one form of student aid.

One of the analytic difficulties confronting this study is the problem of determining the cost of education as opposed to the more inclusive costs of operating institutions. The Center for Educational Statistics (CES) estimates that, in 1981, the total current fund expenditure per student, including all the above activities, was roughly $7,800 per student. The results of the current study indicates the total actually spent for "education" was closer to $4,600 per student.

Federal student aid totaled $18.9 billion in the same year. With a full time equivalent enrollment of nine million students, that results in just over $2,000 federal dollars per student. Much of this total expenditure is not classified as a federal subsidy. Approximately $8.4 billion is off-budget, including all student loans to be paid back and matching funds required from institutions by the various programs. If these off-budget totals are subtracted from student aid totals, the federal appropriation available is roughly $1,170 per student. In this study, the amount of subsidy reported per undergraduate student in the 1983-84 academic year was $1,038. This reflects differences from the Federal appropriation in the way subsidies were calculated for this study, which excludes college work-study and uses different procedures to estimate the loan subsidy. Another difference is that this group does not include graduate students or proprietary school students who, on the average, receive more aid than undergraduates.

The total student aid provided by states was about $900 million in 1981 (NASSGP, 1987). Privately provided aid, which is the most difficult to estimate, probably provides at least an equal amount to students. The addition of these non-federal sources of aid raises the total aid available per student about 20 percent above the federal level.

Institutions receive income from private as well as public sources. Endowments, sales and services of educational activities, including hospitals and other sources, all provide institutional income. Some, but not all, of this income is spent for the direct costs of educating students.

B. Definitions and Limitations

1. Subsidy. The central concept in this analysis is that of education subsidy. Generally, subsidy represents the amount of money from all sources provided for a students education above and beyond the individual's or his family's contribution. Educational subsidy is defined, for purposes of this study, as the "education and general" (E & G) expenditure plus the grant aid and grant equivalent student aid (this concept will be defined later in this section) received by the student, minus tuition paid by the student. The definition used in this analysis does not include foregone taxes as a subsidy to individuals and institutions because the amount would have to be estimated in the most general way and would result in questionable conclusions. There also may be subsidies available to students through housing or food services on campus which are not taken into consideration in this study.

The E & G measure was taken from the HEGIS finance data and modified by excluding expenditures for research, scholarships and fellowships. These items were excluded because research expenditures do not bear directly on the educational experience of undergraduates, which is the population under examination in this study. Grants and scholarships were excluded because they are accounted for in the individual student record.

The tuition for a full-time (in-state for public colleges) undergraduate was subtracted from this total, resulting in the institutional subsidy available to the student. The tuition estimate was taken from the HEGIS file because it was considered a more reliable estimate than student reported tuitions.

There are three limitations to this measure of subsidy. First, the subsidy available to students in an institution will vary by level of enrollment; freshmen receive less subsidy than graduate students. Second, the subsidy will vary by type of program; engineering majors receive larger subsidies than sociology majors. Third, universities with large graduate enrollments spend more on graduate students than on undergraduates. The institutional average includes graduate students and, thus, is greater than the amount spent on undergraduates' education. Attempts to estimate the effects of these differences would introduce untested assumptions into the analysis. Therefore, a decision was made to use uncorrected institutional averages.

The E & G expenditure total excludes everything spent for all auxiliary enterprises, including hospitals, dormitories, cafeterias, book stores and other activities unrelated to the direct costs of providing education. The E & G expenditures used here includes expenditures for instruction, public service, academic support, student services, institutional support, operation and maintenance of plant, and transfers. This aggregate amount was divided by the total number of students enrolled to calculate a per student subsidy. The number of students was calculated on a head count basis because the HEGIS finance tape contains only the head count number and not a division into part- and full-time status. This obviously reduces the estimated institutional subsidy for community college students relative to students in the other sectors because of the large proportion of part-time enrollment in two-year institutions.

Calculation of the subsidy available to students through student aid also required some estimation. Student aid can take three forms: grants, subsidized loans and subsidized work. Grants are simple to calculate and are given full face value as a subsidy. Subsidized work is not included since a student must work for pay. Thus, a subsidized job is no different than any other job and from the student employee's perspective it is employment, not a subsidy.

Subsidized loans present the most complicated form of subsidy. Loans include an interest subsidy, much of which is realized in the future, as well as a requirement that the borrower repay the original principle and some interest costs. There are several loan programs with different subsidies. In order to estimate the current grant equivalency of the subsidy, the market value of an unsubsidized loan was assumed to be 12 percent annually. This is the loan that a student or his family would be forced to take if there was no subsidy loan program available. A student loan interest rate of zero percent was assumed while in college, and eight percent during repayment after leaving college. The difference between the market interest rate and the subsidized interest rate was calculated based on an assumption of two years in college and repayment over ten years. The

future subsidies were discounted to a current or present value. This means that a future subsidy is not as valuable as a current subsidy and is discounted to reflect the time value of money. Under these arbitrary assumptions the present value of the grant equivalency of a loan was estimated to be roughly 30 percent of the face value of the loan. Obviously, this is an estimate and would change as interest rates changed, or as assumptions changed about the length of repayment. For example, assuming three years in college and 13 percent market interest rate results in a 37 percent of the face amount of the loan as a present value of the subsidy.

The type and source of loans and grants was not distinguished in the analysis. There is no attribution of the source of the loan or grant because it is not evident that students recognize the source of particular aid; only that they received the aid and the amount.

2. Institutional Expenditure. This is not a measure of subsidy but a measure of E & G expenditure without tuition being subtracted. This provides information on the amount of institutional money that is being expended for education. A high tuition college could provide relatively little institutional subsidy, but could expend a great deal on the education of undergraduate students. On the other hand, a low tuition college could provide a significant subsidy, but not expend very much on education. Information on this point will help in estimating the proportion of the educational expenditure that is provided as a subsidy.

3. Income. Another measure used in the analysis is income. The measure of income used was 1980 family reported income, when the students were high school seniors. The students were assigned this income for each of the years used in the analysis. No correction was made for changes in family income or dependency status in students later years. No modification was made for family size, single head of household, or other family circumstances which could affect a family's ability to pay for college. Given this opportunity for change in financial situation, the patterns among the income groups were found to be similar in the two years for which data are reported

4. Equity. For purposes of this analysis, equity was determined to exist if those from the lowest income group received the largest overall subsidy. Each increasingly higher income group should receive less subsidy if the system is equitable. This definition of equity is a very straightforward, if limited, measure of how much subsidy is received by students from families with different incomes. Part of the total subsidy may reflect institutional expenditures and part may come from direct aid to the student. The subsidy may be provided by federal, state or private sources. The analysis does not include information on those who did not attend any college. Evidence has been consistent over the years that college attendance is related to income. The lower the family income, the less likely their children will attend college.

The choice of a four-year or a two-year college is also related to socio-economic standing. High SES students are more likely to enter a

four-year institution when they attend college. Students with high ability are also more likely to attend a four-year college (Baily and Collins, 1977).

5. Ability. Ability was determined based on the composite ability measure used in HS&B. Individuals were assigned to quartiles based on their scores. The ability test was a one hour test including basic mathematics and language skills. Race and ethnic group definition also was taken from the HS&B tape.

C. Research Design and Methodology

Two data sources are used in this project. High School and Beyond (HS&B) is a longitudinal data set which follows a cohort of students who were high school seniors in 1980. The sample is weighted to reflect the universe of students in that cohort. The enrollment status of the group in this study is reported for the years 1980-81 and 1983-84. This corresponds roughly with the freshman and senior year in college for those students making standard progress toward a bachelor's degree, which most of the students in this sample did not do. All estimates of student subsidy were developed using HS&B data. The institutional records selected were for those campuses attended by students in the sample. The sample does not represent a cross section of all students. Obviously it excludes older students. The mix of institutions attended by members of the sample should represent a cross-section of all colleges in the universe. Because 18 year old students are mostly freshmen, the mix of institutions attended differs from those attended by all students in the 1983 sample. There was a decline in the proportion of students enrolled in the two-year schools and an increase in the proportion of students in the four-year schools. The use of data from two different years, each with their potential biases, provides us with more confidence in the results if both years indicate the same patterns of subsidy. A third year, 1981, was included in the initial data collection but because of several data problems has been excluded from the final report. Mainly, the problems had to do with records that were not useable because of missing data. The result was too few records to make useful comparisons with other year's data.

HS&B employed a two stage sample design. In the first stage, stratified disproportionate samples of schools were selected from public and private high schools with 12th grades in the 50 states and Washington, D.C.. In the second stage, simple random samples were taken of seniors attending high school who could finish school by the end of the summer.

The design provided for a sample of 1,122 high schools and 36 seniors and 36 sophomores per school. A total of 811 (72 percent) of the 1,122 eligible schools participated in the survey. There were 204 matched replacement schools which brought the total of participating schools to 1,015, or 90 percent of the target. Student questionnaires were completed by 28,240 (85 percent) of the eligible sampled seniors in the participating schools. In 1980 there were 6,020 (unweighted) useable records of students enrolled in college that were included in the analysis. In 1983 the

unweighted number was 5,151 students enrolled. The single most important reason for excluding a record in this study was the lack of a match between the individual record and the institutional record. Only students that were reported to have enrolled in a college were used in the analysis of subsidy. There were an adequate number of records in each analytic category to support the simple comparison of means that were utilized in the study.

The data collected for each student includes family income, family socio-economic quartile, student ability quartile, student aid received and attendance status. Attendance status includes full- or part-time and the type of institution attended. Colleges are reported as two-year, four-year, public or private.

The records are used cross sectionally, that is they do not follow the same student through the several years. Different students make up the population in different years because some drop-out and others enroll. The mix of institutions changes by year. For example, there are fewer students enrolled in the two-year colleges in 1983 than in 1980. There was no correction for inflation in the report. All values are reported in current dollars. The two years used, 1980 and 1983, did reflect a period of inflation. The Consumer Price Index increased by 17 percent between the two time periods. To determine whether there had been a change in subsidy between the two time period, totals in 1983 would need to be deflated by 17 percent. The results (see appendix A for table) indicate that there was no significant difference in subsidies between the two years with the exception of the decline in the subsidies available to students in public four-year campuses between the two time periods.

The enrollment in 1983-84 represents 85.8 percent of the enrollment in 1980. That relatively small overall drop represents a great deal of internal change. Of 100 students enrolled in 1980-81, nearly 45 were no longer in college in 1983 while 30 students who were not enrolled in 1980-81 were enrolled at that later time.

The second source of data is the Higher Education General Information Survey (HEGIS). This data is collected from institutions each fall and includes information on enrollment, finances, faculty and staff and affiliation. Estimates of institutional expenditures, tuition and institutional subsidies were taken, or estimated, from HEGIS data.

Both HEGIS and HS&B identify an institution by its FICE code, which is an institutional identification number. This allows each student record to be assigned to the correct institution. This merging of records allowed a data base to be developed which included both the student aid subsidy and the average institutional subsidy. There were some records that could not be merged because of missing or incorrect FICE codes. The number of non-matches in 1983 and 1980 was between 18 and 29 percent of all records of enrolled students. The missing records appear to be randomly distributed among the different student categories so there is no reason to believe that a consistent bias was introduced in the results. Data are reported in tables for academic years 1980-1981 and 1983-84 and include any students enrolled in each of those years. Intermediate years were collected as a

quality control check but t they are not reported here in order to maintain simplicity. The years repr present the first and third year out of high school. A student cannot b be assigned to an academic year in college with the reported data. Student ts were defined as enrolled if they were full or part-time any time during t the year. If a student changed colleges in the middle of the year, he or s she was assigned to the first institution in which he or she was enrolled.

A number of student rec cords were dropped because they contained insufficient data to suppor rt the analysis. Examples of missing data include the previously mentioned pr problem with non-matchable FICE code as well as other problems such as no f family income, no reported race or ethnic group, or no ability measure. In some cases, such as student aid reports, it is difficult to determine if t there is a missing responses or the student received no aid. Records w were only dropped from the particular analysis which required the data, no ot from the overall study. There is the possibility that these miss sing records may have introduced some bias in the results.

Per student subsidies were calculated on a head count basis. There were two reasons for this. The first is that the HEGIS finance tape includes only headcount enr rollment. Adjustments for the percentage of part-time students could have be een made using the HEGIS enrollment tape but, because of project budget l limitations, this was not done. The second reason is more complicated. Becau use the HS&B is a longitudinal tape a student may be full-time in one enrollm ment period and part-time or non-attending in a second enrollment period dur uring the same year. It would be an arbitrary decision to declare these st student full- or part-time so enrollment was calculated on a head count b basis.

Procedurally, the above ve considerations mean that a student was identified as enrolled in co college on the HS&B tape, regardless of whether they were part- or full-tim me. They were assigned to the appropriate college on the HEGIS tape. The act tual student aid report by the student was identified and the average i institutional expenditure for education was calculated for the head cou unt enrollment reported by the institution.

An alternative would b be to use the concept of full-time equivalent enrollment equating three p part-time students to one full-time student. Doing this would increase th the average estimated subsisdies available to all students. Roughly 42 perce ent of all students in college attend part-time; 29 percent in four year sch hools and 63 percent in community colleges (ACE, 1984). If the correction fo for part-time enrollments was made it would increase the overall subsidy dy by 38 percent with an increase of 24 percent for students in four year sc schools and 72 percent for community colleges. If these corrections were made e the overall estimated subsidy would increase and the difference in the subsid idies available to students at four- and two-year campuses would be more near rly the same but subsidies available to students in two-year schools would st still be roughly $2,000 less than subsidies for students in four-year school ols. (Table A-1 in Appendix A displays the estimated changes in subsidi dies by institutional type.)

II. RESULTS

The sequence of tables reporting results begins with a description of those students who did not attend college compared to those who did. This is followed by tables describing the subsidy available by income, race and ethnic group, and ability for those attending college. Next, a series of tables presents the subsidies available by institutional type and control. The section closes with a brief review of differences in subsidies between aided and non-aided students. The final section includes a discussion of the implcations of the study's findings.

A. Who Attends College?

According to the HS&B, roughly half the class of 1980 did not attend college in the first year out of high school. That proportion of non-attenders dropped to roughly 35 percent in the four year period following high school. The probability of attending college by income is shown in Table 1.

Table 1

Proportion of Students Attending College by Income

Income	Proportion of Group Attending College in 1980
< $7,000	38.3%
7-12,000	45.0
12-16,000	46.8
16-20,000	48.8
20-25,000	53.5
25-38,000	62.7
38,000+	67.3
Average for all Income Levels	49.8

The probability of going to college directly after high school is closely related to family income. Offspring of low income families are less likely to go to college than children in higher income families. Over 60 percent of the students from families with under $7,000 income did not

attend any college in 1980-81. Less than 33 percent of those from families with income over $38,000 did not attend.

There also are differences in attendance among racial and ethnic groups (See Table 2).

Table 2

Proportion of Students Attending College by Racial and Ethnic Groups

Group	Proportion of Group Attending College in 1980
Hispanic	51.1%
Indian	34.2
Asian	66.3
Black	42.6
White	53.6
Average Proportion of All Races Attending	49.8

Table 2 indicates that Asians are more likely to go to college directly after high school than any other group. Whites are next, followed by Hispanics, Blacks and Indians. Nearly two-thirds of the Asian high school graduates attended college and only one-third of the Indians.

The next table presents the probability of students attending college by a composite measure of ability based on test scores. The students are organized into quartiles based on their scores.

Table 3

Proportion of Students Attending College by Ability

Ability Quartile	Proportion of Group Attending College in 1980
Lowest	27.7%
Second	46.4
Third	58.8
Highest	76.0
Average for All Ability Levels	49.8

There was a strong relationship between ability and the propensity to attend college in 1980. Less than 30 percent of those in the lowest ability quartile go to college compared to over 75 percent in the highest quartile.

This brief review of who tends to go to college confirms other historical data indicating that low income and low ability students are less likely to attend college than are other groups. Analysis by race and ethnic group also confirms prior data showing that Indians and Blacks are less likely to go to college, but Hispanics and Asians are more likely to go to college, than the average. Attendance rates for Whites are close to the mean because they include the preponderance of cases.

The subsidies available to college students are not utilized by individuals electing not to attend. This report does not include high school dropouts, which would probably exacerbate some of the differences noted here. The same factors that account for college attendance are also related to dropping out of high school.

The results confirm previous findings that college attendance is more likely for the wealthy and academically able. Attending students receive a subsidy which is not available to those not attending. This has not been defined as inequitable as the term is used in this study. For whatever reason, there are some people that do not have an interest in higher education or participate in other activities by preference. The propensity to attend college is related to income and ability which are correlated. A good deal of higher education policy over the last several decades has been aimed at changing this fact. The data from other research (Lee, 1984) make the point that not much progress has been made toward the goal of equalized rates of attendance among income groups and, in the largest sense, this can be defined as inequitable.

B. Who Receives a Subsidy by Income?

For those attending college, the issue is how much subsidy is available to students with different characteristics. Table 4 presents the subsidies available for 1980 and 1983 by different income categories. This is the total subsidy available to students through the sum of institutional subsidies and those available directly to the student. There has been no correction for inflation in this report. The two years reflect different students attending different schools. The family income reported in 1980 is used for students in both the years, again there has been no correction for inflation. The important point made in these tables is the relative difference within a year, not the differences between the two years or the absolute values presented.

Table 4

Total Subsidy Available by Income

Income	1980	1983
< $7,000	$3,812*	$4,344*
7-12,000	3,727*	4,342*
12-16,000	3,524	4,102*
16-20,000	3,493	3,917
20-25,000	3,282	3,959
25-38,000	3,131*	3,796*
38,000+	3,328	4,037
Average for all Income Levels	$3,429	$3,980

*Significantly different from the overall mean (05. level of confidence)

Generally, students from families having under $16,000 income receive a subsidy greater than average while those in the higher income range receive less overall subsidy in both years. There is slightly less variation in the range in 1983 compared to 1980. The distribution of the subsidy is generally equitable, but the differences are not very great.

The next table presents the distribution of the subsidy available to students in the form of aid. This aid is from all federal, state, and private sources. As indicated earlier, 30 percent of the face value of loans are estimated to be equivalent to a grant.

Table 5

Student Aid by Income

Income	1980	1983
<$ 7,000	$1,477	$1,262
7-12,000	1,486*	1,386*
12-16,000	1,123*	1,187*
16-20,000	1,237	1,159*
20-25,000	1,066	1,126*
25-38,000	901*	866*
38,000+	733*	795*
Average for all Income Levels	$1,080	$1,037

*Significantly different from the mean (.05 level of confidence)

The student subsidy is related to income with the lowest income students receiving roughly twice as much as the highest income students in each of the two years. The one probable reason why student aid declines in 1983 relative to 1980 is because of changes in policy which restricted the eligibility of students for aid from the more liberal Middle Income Student Assistance Act rules that were in effect in 1980. In 1983 fewer students reported receiving aid, but those who did receive aid had larger average award packages. Further work needs to be done to determine if the difference can be accounted for by missing data.

Table 6 presents the average amount of money spent on education by institutions and the average tuition paid for each of the income categories. The amount expended includes the tuition paid by the student as well as the subsidy. Subtracting tuition from expenditures yields the institutional subsidy. The table contains three columns of numbers for each of the years. The first column (A) shows the average amount per student that institutions spent on education, including the tuition income paid by students, so it does not constitute the subsidy. The second column (B) is the average tuition paid by students in each of the income levels. The third column (C) is the institutional subsidy, the amount of subsidy available to students from institutions. Institutional subsidy and the subsidy received directly by students are additive to produce total subsidy. The actual totals will not sum exactly because of missing values in the different categories.

Table 6

Institutional Expenditures for Education by Income

Income	1980			1983		
	A Total Expended	B Tuition	C Inst. Subsidy[1]	A Total Expended	B Tuition	C Inst. Subsidy[1]
< $7,000	$3,466	$1,099	$2,367	$4,467	$1,405	$3,062
7-12,000	3,311*	1,057	2,254	4,266*	1,325	2,941
12-16,000	3,399	1,009	2,390	4,251*	1,359	2,892
16-20,000	3,467	1,158	2,309	4,283*	1,526	2,757
20-25,000	3,498	1,237	2,261	4,532	1,708	2,824
25-38,000	3,473	1,178	2,295	4,567	1,667	2,900
38,000+	4,267*	1,718	2,544	5,596*	2,409	3,187
Average	$3,552	$1,217	$2,335	$4,597	$1,676	$2,921

*Significantly different from the mean (.05 level of confidence)
[1]This figure is derived and thus its significance cannot be calculated.

The amount spent on education tends to be greater in both years for the higher income groups as compared to the lower income groups. The total expended rises slightly more rapidly than tuitions as income increases, resulting in a slight advantage in institutional subsidy for the very highest income group. The subsidy for the remaining groups shows no pattern. As will be indicated in a later section, community colleges provide less subsidy to students than four-year colleges.

C. Who Receives a Subsidy by Racial and Ethnic Group?

A good deal of attention has been given to the lagging college attendance rate of minorities in this country. The preliminary data reported earlier indicates the problem is better defined as a problem for Blacks, Indians and, to a lesser extent, Hispanics. This section describes the subsidies utilized by these groups after they enroll in college.

The minority groups are self identified on the HS&B. Hispanic is a composite group comprised of Puerto Ricans, Cubans, Mexicans and others. Other research has indicated divergent college attendance rates for different Hispanic groups (Lee, 1985). This sample was too small to allow separate analysis of these sub-groups. The small number of Indians in the sample results in greater variations in their statistics compared to those of other groups.

Table 7 indicates that, in terms of total subsidy, Asians and Blacks receive the largest subsidies and Indians and Hispanics receive the least.

Table 7

Total Subsidy by Race and Ethnic Group

Group	1980	1983
Hispanic	$3,157*	$3,610*
Indian	3,060	3,667
Asian	4,393*	4,782*
Black	3,810*	4,493*
White	3,221*	3,839*
Average for all groups	3,391	3,980

*Significantly different from mean (.05 level of confidence)

Blacks receive the largest amount of student subsidy relative to the other groups. There is only a $400 range between the highest and lowest subsidy, which went to Hispanics. The fact that Hispanics receive a relatively low institutional subsidy, and a low student subsidy, probably reflects the fact that a relatively large proportion of Hispanics are

enrolled in community colleges. Further research would be necessary to determine the relationship between type of institutions attended by different social and ethnic groups. Table 8 presents information on the student subsidy available to the groups in both years.

Table 8

Student Subsidy by Racial and Ethnic Groups

Group	1980	1983
Hispanic	$922*	$880*
Indian	1,129	836
Asian	1,083	962
Black	1,328*	1,188*
White	1,039	1,048
Average for all groups	1,080	1,037

*Significantly different from the mean (.05 level of confidence)

Table 9 presents information on institutional expenditures and subsidies available to the different social and ethnic groups. Consistent with the two previous tables, Asians receive the largest institutional expenditure (A) and Hispanics and Indians the least. Blacks receive higher than average institutional expenditure in both of the years.

The pattern changes slightly when institutional subsidies are considered (C) but Asians still do best followed by Blacks. Because Hispanics and Indians pay a lower tuition (B), their institutional subsidy (C) is more nearly comparable with that of whites.

Table 9

Institutional Expenditure by Racial and Ethnic Group

Group	1980			1983		
	A Inst. Expend.	B Tuition	C Inst. Subsidy[1]	A Inst. Expend.	B Tuition	C Inst. Subsidy[1]
Hispanics	$3,144*	$ 906	$2,238	$3,881*	$1,144	$2,737
Indians	2,901*	968	1,933	3,941	1,108	2,833
Asians	4,752*	1,266	3,486	5,585*	1,748	3,837
Black	3,723*	1,196	2,527	4,831*	1,553	3,278
White	3,554	1,360	2,194	4,695	1,938	2,757
Average	$3,552	$1,217	$2,335	$4,597	$1,676	$2,921

*Significantly different from the mean (.05 level of confidence)
[1]This figure is derived and thus its significance cannot be calculated.

D. Who Receives a Subsidy by Ability?

Ability is a composite measure based on achievement tests administered to all seniors in the high school sample. Ability has the strongest relationship to subsidy compared to the two other measures of income and race and ethnic group. The highest ability quartile students receive the largest subsidy on all three of the subsidy measures across both years. The relationship between the other three quartiles is not as marked but there is very nearly a perfect ranked relationship between subsidy and ability. The lower ability students receive the least amount of subsidy on all three measures. Table 10 describes the total subsidy available to students by ability quartile.

Table 10

Total Subsidy By Ability

Ability Quartile	1980	1983
Lowest	$2,676*	$3,225*
Second	2,974*	3,492*
Third	3,235*	3,719*
Highest	4,260*	4,836*
Average for all groups	$3,391	$3,980

*Significantly different from the mean (.05 level of confidence)

The increase in the subsidy between the third and highest quartile is the most marked. Not only are high ability students more likely to go to college, but they receive much more subsidy when they attend.

The advantage for high ability students is consistent in the other measures. There is a close relationship between ability and student subsidy. The higher the ability measure, the greater the subsidy. Perhaps most surprising is the outcome for student subsidy. Given that the majority of aid is needs tested and not awarded on the basis of ability, it is surprising that there is such a significant increase in the amount of aid received by students in the top ability quartile relative to the other groups. One possible explanation is that high ability students are more likely to attend higher cost colleges and are thus eligible for more student aid. Table 11 provides the distribution of student subsidy by ability.

Table 11

Student Subsidy by Ability

Ability Quartile	1980	1983
Lowest	$ 684*	$ 658*
Second	840*	822*
Third	985*	902*
Highest	1,575*	1,468*
Average	$1,080	$1,037

*Significantly different from average at .05 level of confidence

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The final table in this series on ability reflects the total institutional expenditure and subsidy available to students by ability. It confirms the results of the preceding two tables.

Table 12

Institutional Expenditure by Ability

Ability Quartile	1980			1983		
	A Inst. Expend.	B Tuition	C Inst. Subsidy[1]	A Inst. Expend.	B Tuition	C Inst. Subsidy[1]
Lowest	$2,702*	$ 713	$1,989	$3,402*	$ 840	$2,562
Second	3,052*	919	2,133	3,899*	1,243	2,656
Third	3,397	1,151	2,246	4,327*	1,555	2,772
Highest	4,531*	1,770	2,761	5,577*	2,450	3,327
Average	3,352	1,217	2,135	4,597	1,676	2,921

*Significantly different from average (.05 level of confidence)
[1]Significance tests could not be performed for institutional subsidy because institutional subsidy is a derived number.

Expenditure, tuition and institutional subsidy are all closely related to ability. As ability increases so does the value of all three of these measures. The relationship is clear and unambiguous. The most notable increase is the one between the third and highest quartiles. Neither income nor race and ethnic group has as strong a relationship to subsidy as does ability.

E. Subsidy by Institutional Type and Control

Table 13 compares four-year private, four-year public and two-year public students in terms of the total subsidy received (A), the student subsidy received (B), the amount the institutions expend on their education (including tuition) (C), Tuition (D) and, finally, the institutional subsidy (E).

Table 13

Subsidy by Institutional Type and Control

1980

Type	A Total Subsidy	B Student Subsidy	C Inst. Expend.	D Tuition	E Inst. Subsidy
Pri. four	$4,587	$2,376	$5,627	$3,416	$2,211
Pub. four	4,517	1,205	4,241	929	3,312
Pub. two	1,996	543	1,844	391	1,453

1983

Type	Total Subsidy	Student Subsidy	Inst. Expend.	Tuition	Inst. Subsidy
Pri. four	$5,605	$2,707	$7,292	$4,394	$2,898
Pub. four	5,069	1,226	5,073	1,230	3,843
Pub. two	2,394	538	2,448	584	1,856

Subsidies received by students in public and private four-year colleges (A) remained roughly the same in 1983 with a slight but statistically significant ($536) advantage to students in private colleges. Private college students receive more than twice the student subsidy (B) received by public college students but pay more than 3.5 times as much tuition (D). Even though the subsidies are nearly equal for public and private college students, the amount spent on the education (C) of private college students is nearly 44 percent greater. The variance around the mean for institutional subsidies (E) is much greater for private than public colleges (this variance is not reported in the table). Students in public colleges receive nearly $1,000 more institutional subsidy than students in private colleges (E). There is a balancing of sorts with private college students receiving more student aid and public college students receiving more institutional aid. The resulting overall subsidy available to students is very nearly equal.

Community college students receive less than half the subsidy available to students in four-year colleges. Neither the student subsidy (B) nor the institutional subsidy (E) is near the magnitude of that for the senior institutions in either year. As indicated earlier, data problems may result in a substantial underestimate of community college subsidies because of the high percentage of part-time students attending these institutions (Appendix A contains a calculation for correction).

F. Differences Between Aided and Non-Aided Students

In both 1980 and 1983 students who received student aid attended colleges with higher tuition. The higher cost colleges, in turn, tended to spend more money on students' education. It is not possible to determine causality from these differences. Students could go to higher tuition colleges because they get aid or they got aid because they went to colleges with higher tuition.

Table 14 details some of the differences between aided and non-aided students in 1980 and 1983.

Table 14

Differences Between Aided and All Students

	1980		1983	
	Aided	All Students	Aided	All Students
Inst. Exp.	$3,957	$3,552*	$5,420	$4,597*
Tuition	1,421	1,217	2,141	1,676*
Subsidy	4,509	3,391*	5,953	3,980*
Stud. Sub.	2,060	1,080*	2,722	1,037*

*Significantly different at .05 level of confidence)

As would be expected, the subsidy levels were higher in both years for aided students. In 1983 fewer students reported receiving aid, but those that received aid had larger amounts. In 1980 46.7 percent of the students reported receiving some aid and in 1983 that percentage had dropped to 34.0 percent. This reflects the greater proportion of the cohort attending college part-time in 1983 compared to 1980 and changes in federal student aid policy which restricted eligibility in 1983.

III. REVIEW AND CONCLUSIONS

The propositions set forth at the beginning of this study were confirmed in some cases and not others. In general, total subsidies are equitably distributed. Lower income students generally receive more support than students from higher income families. That was true both in 1980 and 1983. In 1980 the subsidy was roughly $3,400, with the income group receiving the least subsidy receiving about $3,300 and the group getting the most about $3,800. The range was only $550 between the different income groups in 1983

with the lowest subsidy group receiving about $3,900 and the highest $4,350. The overall subsidy differences were not very great but they were in the expected direction.

The estimated student subsidy is also equitably distributed. Low income students received the largest student subsidy, getting about twice the amount of direct support received by the highest income students.

Institutional expenditures for education, which includes tuition, are related to income. Students from higher income families tend to have more spent on their education than is spent on educating students from lower income families. Higher income students pay more tuition but receive an institutional subsidy nearly equal as to that received by lower income students, with only a slight advantage to the very highest income group. Students from the highest income group pay the highest tuition and receive the largest institutional subsidy.

The second proposition suggested that minorities would receive a greater subsidy than Whites because generally they come from lower income families. This was only partially supported. Asians and Blacks received the greatest overall subsidy in both years while Hispanics and Indians received the least. Blacks receive more student aid than any other group followed by Whites. The Hispanics and Indians received less than average. This difference may reflect the higher probability of Hispanics going to two-year public colleges and qualifying for less aid than Blacks who are more likely to attend private colleges than Hispanics. Further work needs to be done to confirm this assumption. Differences in the income characteristics of different racial and ethnic groups could also influence the results.

The explanation of subsidy differences among ethnic groups, resulting in part from attendance in different institutions, is supported by the fact that institutional expenditures are lower for Hispanics and Indians while they are higher for Blacks and Asians. Asians attend colleges that spend significantly more on education than other racial and ethnic groups, Blacks are a distant second. There is only partial support for the proposition that minorities receive a greater subsidy than whites.

The next proposition suggested that because low ability students are poorer they would garner more student aid. This assumption was emphatically rejected. The strongest factor related to both measures of subsidy and educational expenditure was high ability. The top ability quartile students receive significantly greater subsidy than any of the other quartiles. Even the utilization of student aid, most of which is need tested, is greater for high ability students than low ability students. This may be the result of the type of college attended and the active pursuit of student aid by these students. Measures of institutional expenditure, tuition and institutional subsidy all increase with ability. The fact that high ability students are less likely to attend two-year public colleges than lower ability groups, raises subsidies significantly for that upper ability quartile. The pattern of subsidies among the three types of institutions suggest that students attending four-year colleges receive roughly the same total subsidy regardless of whether they attend a public or private college. Students in

re student subsidy while those in public colleges
private colleges receive mor irectly from the institution. When tuitions are
receive a greater subsidy di expend more on education than do public four-year
included, private colleges ex
colleges.

or students that are receiving aid to attend
There is a propensity for ms. Such institutions make larger expenditures
colleges with higher tuitions is not possible to imply causality one way or the
for student education. It is students may attend more expensive colleges or
other to this fact. Aided st ensive colleges may receive more aid.
students attending more expen

that the diverse funding system for higher
Overall, it is evident th nt subsidies being available to different groups
education results in differen atterns suggested in this report are remarkable
of students. The subsidy pat ll as similarities. The differences in subsidies
for their differences as well racial and ethnic groups are striking. The
among ability groups and the ilable to different income groups and students
similarity in subsidies avail four-year colleges is an equally interesting
attending public and private
finding.

s reflects, in part, conscious policy decisions
This pattern of subsidies udent choices each year. The results suggest
combined with millions of stu nt decision that determines overall subsidy is
that the single most importan our-year or a two-year college. Students
whether some one attends a fo ear college receive a lower institutional
attending a lower cost two-ye subsidy. However, this difference, as noted, is
subsidy and a lower student s were not adjust to take into consideration the
exaggerated because the data udents (see Appendix A).
distribution of part-time stu

so closely related to subsidy suggests that
The fact that ability is more closely related to ability than income.
choice of institution may be the subsidy available to students.
That choice in turn predicts

y should be interpreted as a first effort to
The results of this study The results suggest that there are different
examine this complex issue. to students attending college depending on
amounts of subsidy available cessary compromises forced on the study by data
their circumstances. The nec assumptions distort the final results somewhat.
limitations and definitional he results underestimate the subsidies of
It is highly probable that th es and overestimate those for students in
students in community college uate programs. The quality of data always
universities with large gradu tentative generalizations. Missing values and
constrains making more than te a role in limiting the amount of usable data in
unmatched records both play a started, improvements in the data have been
the study. Since this study inclusion here. The High School and Beyond data
introduced but too late for i study because it only contains students in a
set is not perfect for this st
particular age range.

Taking all of these limitations into consideration, the results have enough consistency and face validity to suggest that they reflect an underlying reality. The results suggest some further research that could be done to confirm the results and answer more questions. It would be helpful to know something about the interaction of the different variables. For example, knowing the combined effect of income and ability on subsidy, or the relationship of type and control of institution to ability, would be helpful in developing a fuller understanding about variations in subsidy available to students with different characteristics. These would help answer some questions raised by the preliminary study and improve our understanding of what subsidy students are receiving for a college education.

APPENDIX A

Estimated effects of using full-time equivalent enrollment, instead of head count enrollment, in estimating total subsidy would result in calculations of: (1) overall subsidies increasing by 38 percent, (2) subsidies for students in four-year schools increasing by 24 percent and (3) subsidies for students in two-year schools increasing by 72 percent.

Table A-1

Estimated Changes in Total Subsidies Comparing
FTE and Head Count Enrollment

	1980		1983	
Inst. Type	Head Count	FTE	Head Count	FTE
Private 4 Yr.	$4,587	$5,688	$5,605	$6,950
Public 4 Yr.	4,517	5,601	5,069	6,286
Public 2 Yr.	1,996	3,433	2,394	4,118
Average	3,391	4,680	3,980	5,492

TABLE A-2

1983 Total Subsidies Deflated to 1980 Prices

Inst. Type	1980	1983 Deflated to 1980
Private 4 Yr.	$5,688	$5,769
Public 4 Yr.	5,601	5,217
Public 2 Yr.	3,433	3,418
Average	4,680	4,558

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